UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,112	12/12/2003	Donald Giles Allen	HSJ9-2003-0144US1	1925

7590 11/29/2006

ATTN: John J. Oskorep
One Magnificent Mile Center
Suite 1400
980 N. Michigan Avenue
Chicago, IL 60611

EXAMINER	
KIM, PAUL D	

ART UNIT	PAPER NUMBER
3729	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/735,112	ALLEN ET AL.	
	Examiner	Art Unit	
	Paul D. Kim	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *8,9 and 11-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/12/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is a response to the restriction requirement filed on 4/27/2006.

Response to the Restriction Requirement

1. Applicant's election with traverse of Group I, claims 1-7 and 10, in the reply filed on 4/27/2006 is acknowledged. The traversal is on the ground(s) that no separate utility exists between the Groups I and II. This is not found persuasive. Even though the claim 14 is amended by including a limitation, which is similarly recited in claim 1, Group II teaches a special technical feature of etching to remove portions of the hard-baked resist in accordance with the write coil pattern and electroplating an electrically conductive material comprising copper within the etched portion of the hard-baked resist, which are not recited in claim of Group I. In addition, the damascene method of Group I is intended to use in forming a magnetic head so that the damascene method of Group I does not have to use to form a write coil as recited in Group II.
Also, the elected Species C is only claim 10, which removes the remaining portions of the hard mask layer by a reactive ion etch (RIE).

The requirement is still deemed proper and is therefore **made FINAL**.

2. Claims 8, 9 and 11-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 4/27/2006.

Specification

3. The abstract of the disclosure is objected to because the abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 7 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Hsiao et al. (US PAT. 6,804,879).

Hsiao et al. teach a process of making a magnetic transducer comprising steps of: forming a hard mask layer and a photoresist layer (48) over an insulator layer (44); performing an image patterning process to produce a pattern in the photoresist layer and etching to remove portions of the hard mask layer in accordance with the pattern follow by etching to remove portions of the insulator layer in accordance with the pattern as shown in Fig. 5; electroplating an electrically conductive material (53) within the etched portion of the insulator layer as shown in Fig. 7; and performing a planarization process over the resulting structure and removing remaining portions of the etched hard mask layer as shown in Fig. 8 (see also col. 5, line 25 to col. 6, line 30).

As per claim 2 the planarization process is improved by the act of etching the remaining portions of the etched hard mask layer.

As per claim 3 the processes Hsiao et al. can be used in forming a write coil for the magnetic head as shown in Figs. 2 and 3.

As per claim 4 the electrically conductive material comprises copper (Cu).

As per claim 7 the planarization process comprises a chemical-mechanical polishing (CMP).

As per claim 10 removing remaining portions of the hard mask layer comprises a reactive ion etch (RIE).

6. Claims 1, 2, 4, 5, 7 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Colburn et al. (US PAT. 6,930,034).

Colburn et al. teach a process of making a magnetic transducer comprising steps of: forming a hard mask layer (130) and a photoresist layer (140) over an insulator layer (120) as shown in Fig. 1a; performing an image patterning process to produce a pattern in the photoresist layer as shown in Fig. 1b and etching to remove portions of the hard mask layer in accordance with the pattern as shown in Fig. 1c follow by etching to remove portions of the insulator layer in accordance with the pattern as shown in Fig. 1c; electroplating an electrically conductive material (140) within the etched portion of the insulator layer as shown in Fig. 1d; and performing a planarization process over the resulting structure and removing remaining portions of the etched hard mask layer as shown in Fig. 1f (see also col. 1, lines 15-59 and col. 4, line 10-40).

As per claim 2 the planarization process is improved by the act of etching the remaining portions of the etched hard mask layer as shown in Fig. 1f.

As per claim 4 the electrically conductive material comprises copper (Cu).

As per claim 5 the hard mask layer comprises SiO_2.

As per claim 7 the planarization process comprises a chemical-mechanical polishing (CMP).

As per claim 10 removing remaining portions of the hard mask layer comprises a reactive ion etch (RIE).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Colburn et al.

Colburn et al. teach that the hard mask layer is made of SiO_2. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to apply the hard mask material as recited in the claimed invention because Applicant has not disclosed that the hard mask material as recited in the claimed invention provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected

Applicant's invention to perform equally well with Colburn et al. because the hard mask as recited in the claimed invention would perform equally well with SiO_2 in Colburn et al. Therefore, it would have been an obvious matter of design choice to modify the hard mask material of Colburn et al. to obtain the invention as specified in claim 6.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D. Kim whose telephone number is 571-272-4565. The examiner can normally be reached on Monday-Thursday between 6:00 AM to 2:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul D Kim
Primary Examiner
Art Unit 3729